

cited art was allegedly not provided. As stated in that IDS, "a copy of each of the documents cited is enclosed." It is, therefore, the belief of the undersigned that copies of the references were indeed filed with the IDS. In the event that the references were separated from the papers as filed, Applicants thus submit herewith a second copy of the PTO 1449 together with a copy of each of the cited references. Because it is believed that copies of the references were filed and because the IDS dated May 28, 1996 was timely filed with a certification and copy of the Search Report (a copy of which is also resubmitted herewith), consideration of these references is respectfully requested and believed to be in order.

The Examiner further requests copies of the foreign art and articles cited in the specification because it is not readily available. Two Japanese publications referred to in the specification, i.e., JPP No. 55-45391 and JPP No. 50-157595 correspond to U.S. Patent No. 4,338,348 and U.S. Patent No. 3,979,527, respectively. These U.S. Patents have already been submitted in an IDS dated June 16, 1994. A further Japanese publication, JPP No. 61-001374 corresponds to U.S. Patent Nos. 4,717,580 and 4,839,189, copies of which are enclosed herewith. Consideration of these references is respectfully requested and believed to be in order in view of the Examiner's request. A PTO 1449 listing the two U.S. Patents is also submitted herewith.

Claims 1 and 3 have been rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Vitzthum et al (U.S. Patent No. 4,204,409). Claims 2 and 4 have been rejected under 35 U.S.C. §103 as allegedly being unpatentable over Vitzthum et al in view of Wheldon et al (U.S. Patent No. 4,282,259). These rejections are respectfully traversed.

Vitzthum et al allegedly discloses the production of hop extracts whereby air dried hops are mixed with supercritical CO<sub>2</sub> at an extraction pressure of "above its critical

pressure (about 73 atmospheres)." The process allegedly liberates "the entire soft resin portion and the essential oils of the hops, but less than 1% of the hard resin portion" (col. 3, lns 19-23). Vitzthum et al thus discloses that "the critical pressure will be at least 70 atmospheres and the temperature at least 30°C." The pressure of "at least 70 atmospheres" and the temperature of "30°C" are the lowest constants for carbon dioxide to be supercritical. Thus, the defined pressure and temperature are mere physicochemical constants for the carbon dioxide. Vitzthum et al further describe the lower limit for extraction of hops with a supercritical carbon dioxide present at 100 atm." By contrast, in the present invention as recited by claims 1 and 3, the upper limit for extraction of hops with supercritical carbon dioxide is "100 kg/cm<sup>2</sup>." Vitzthum et al thus fails to teach or even suggest the instantly claimed invention wherein the hops is extracted "with supercritical or subcritical carbon dioxide solvent at a pressure of 80 to 100 kg/cm<sup>2</sup> to obtain a carbon dioxide extract." Instead, Vitzthum et al teaches use of a much higher extraction pressure, i.e., greater than 100 kg/cm.

In addition, in Vitzthum et al, in addition to essential oil components,  $\alpha$ -acid and  $\beta$ -acid, which are bitter components, are fully extracted. In contradistinction, the present invention provides "essential oil-rich" hop extract by selection of the extraction pressure. Moreover, the claims as now amended recite that "the ratio of essential oil components (ml) to  $\alpha$ -acid(s) in the original hops is increased by at least 2." The cited art thus fails to disclose or even suggest applicants' invention as claimed.

To overcome or remedy this deficiency of the primary reference, Wheldon et al is cited in combination with Vitzthum et al. Wheldon et al, however, fails to overcome or remedy the deficiencies in Vitzthum et al. First, Wheldon et al describes an extraction of hop components with liquid carbon dioxide. According to Wheldon et al, in the production

process hop extract is first obtained by extraction of hops with liquid carbon dioxide. In contrast with the instantly claimed invention, supercritical carbon dioxide was not used. The teachings of use of "liquid carbon dioxide" thus fails to overcome or remedy the deficiencies in the primary reference and fails to teach supercritical carbon dioxide as recited in applicants' claims.

Vitzthum et al, either alone or in combination with Wheldon et al, thus fails to teach or even suggest applicants' claimed invention. Withdrawal of the rejection of the claims under §102 or §103 is thus respectfully requested and believed to be in order.

Claims 5-28 have been rejected under 35 U.S.C. §103 as allegedly being unpatentable over Vitzthum et al in view of Wheldon et al and further in view of Todd Jr. et al (U.S. Patent No. 4,647,464). This rejection is respectfully traversed.

The deficiencies of the combination of Vitzthum et al in view of Wheldon et al are discussed above. Todd Jr. et al was cited by the Examiner as teaching the absorption of a hop oil extract onto fumed silicon dioxide to reduce the amount of aroma which is lost during the boiling of the wort, which is later fermented to produce the finished beer. This teaching fails to overcome or remedy the deficiencies of the combination of Vitzthum et al in view of Wheldon et al. The primary and secondary references fail to teach a process wherein the hops is extracted "with supercritical or subcritical carbon dioxide solvent at a pressure of 80 to 100 kg/cm<sup>2</sup> to obtain a carbon dioxide extract." Further, Todd Jr. et al fails to teach "the ratio of essential oil components (ml) to  $\alpha$ -acid(s) in the original hops is increased by at least 2" as now claimed. In contrast with the teachings of the cited art, the present invention as claimed uses a hop extract comprising an essential oil in an increased ratio of  $\alpha$ -acid to improve the quantity of beer.

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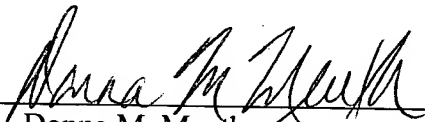
Todd Jr. et al thus fails to overcome or remedy the rejections of the claims.  
Withdrawal of the rejection under §103 is thus respectfully requested and believed to be in order.

Further and favorable action in the form of a Notice of Allowance is respectfully requested. Such action is believed to be in order.

In the event that there are any questions relating to this amendment, or to the application in general, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that prosecution of this application may be expedited.

Respectfully submitted,

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